TREEHAVEN technologies

RVSFB120IPR

FIELD BOX

User & Programming Guide

TREEHAVEN TECHNOLOGIES, INC
24 VILLAGE POINTE DRIVE
POWELL, OH 43065
614.791.8843
http://www.treehavenvision.com

Manual PN: 343117 05/10 Rev A

IMPORTANT SAFEGUARDS

READ INSTRUCTIONS - All safety and operating instructions should be read before the unit is operated.

RETAIN INSTRUCTIONS - The safety and operating instructions should be retained for future reference.

HEED WARNINGS - All warnings on the unit and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS - All operating and use instructions should be followed.

CLEANING - Unplug the unit from the outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a camp cloth for cleaning.

ATTACHMENTS - Do not use attachments not recommended by the product manufacturer as they may result in the risk of fire, electric shock, or injury to persons.

WATER AND MOISTURE - Do not use this unit near water or in an unprotected outdoor installation.

ACCESSORIES- Do not place this product on an unstable car, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult and serious damage to the equipment. Any mounting of the product should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer. Shelf mounting should follow the manufacturer's instructions and should us a mounting kit approved by the manufacturer.

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

VENTILATION - Slots and openings in the cabinet and the back or bottom are provided for ventilation and to ensure reliable operation of the equipment and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked. Equipment should never be placed near or over a radiator or heat source. This product should not be placed in a rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

POWER SOURCES - This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your facility, consult your product dealer or local power company.

GROUNDING OR POLARIZATION - The power supply supplied with this unit is equipped with a grounded alternating-current line plug. This plug will fit into the power outlet only one way. This product must have a reliable earth ground connection. A lack of an earth ground connection is unsafe and will also prevent the lightning protection circuitry from operating correctly.

OVERLOADING - Do not overload outlets and extension cords as this can result in a risk of fire or electric shock.

POWER-CORD PROTECTION - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the monitor.

OBJECT AND LIQUID ENTRY - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the unit.

SERVICING - Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

DAMAGE REQUIRING SERVICE - Unplug the unit from the outlet and refer servicing to qualified service personnel under the following conditions:

- When the power-supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the unit.
- If the unit has been exposed to rain or water.
- If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
- If the unit has been dropped or the enclosure has been damaged.
- When the unit exhibits a distinct change in performance – this indicates a need for service.

REPLACEMENT PARTS - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

SAFETY CHECK - Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

INSTALLATION - Do not install the unit in an extremely hot or humid location, or in a place subject to dust or mechanical vibration. This unit is not designed to be waterproof. Exposure to rain or water may damage the unit.

Warnings

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

DO NOT INSERT ANY METALLIC OBJECT THROUGH VENTILATION GRILLS OR EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

THIS UNIT MUST BE OPERATED WITH A PROPERLY GROUNDED 3-PIN CONNECTION. THIS PRODUCT MUST HAVE A RELIABLE EARTH GROUND CONNECTION. A LACK OF AN EARTH GROUND CONNECTION IS UNSAFE AND WILL ALSO PREVENT THE LIGHTNING PROTECTION CIRCUITRY FROM OPERATING CORRECTLY.

Important Notice

All companies make changes and improvements in their products. Because this product can be set up to interface with equipment other than Treehaven Technologies branded products, there is a possibility that the interface protocols may have changed since this product was tested with the interfacing equipment. Therefore, this unit may not be currently compatible with equipment produced by other manufacturers. The existence of past successful installations proves our intent to provide equipment compatible with other manufacturers, but does not guarantee success.

We recommend purchasing a single unit for bench testing prior to purchasing and installing this product in quantity. Should any problems occur, we will provide technical support (at the user's expense) to analyze the interface protocols of your system. The end user must agree to provide reasonable access to the system in order to study and correct the protocol incompatibility.

In the event that you are unable to make the units work together in the system, please contact Treehaven Technologies at 614-791-8843 for technical assistance. Treehaven Technologies will not be liable for any installation cost, lost revenues, or other cost resulting from the incompatibility.

Contents

Field Box Overview 6

Field Box Connectors 8

Dip Switch Settings
Push Button Switches 9

Using the Axis 282 Encoder 10

Selecting RS-232 Communications for the Remote
And Selecting-485 2-Wire for the Remote 11

Selecting RS-485 2-Wire Communications for the Dome 12

Setting Up the Field Box 13

Displaying the Dome Power Draw Information 26

Operation of the LEDs 28

Jumper List 29

Port Protocol Configuration 30

Port Protocol Selection Option 1 31

Port Protocol Selection Option 2 32

Port Protocol Selection Option 3 33

Port Protocol Selection Option 4 34

Boot Mode and Application Code Updates 35

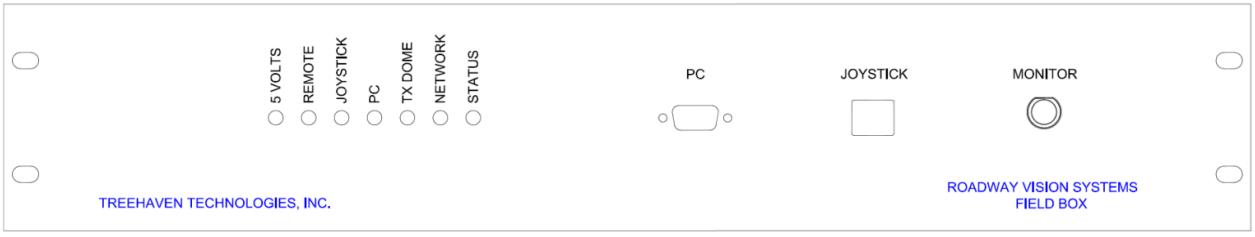
Specifications 39

FIELD BOX OVERVIEW

The Treehaven Roadway Vision System Field Box is an economical, robust CCTV field mounted accessory that provides an assortment of power, data, local camera setup, remote diagnostics, and communications capability. The Field Box features:

- Surge suppression on data, video and power lines.
- Video output for test monitor connection.
- Plug-in connection for joystick controllers.
- Plug-in serial connection for a laptop computer providing PTZ control and camera test and configuration.
- Automatic switching to select either joystick, laptop or remote Operations Center PTZ control.
- Optional integrated Axis 282 Video Encoder for digital video.
- Optional Dome Heater Status/Power Monitor to provide Remote Diagnostics

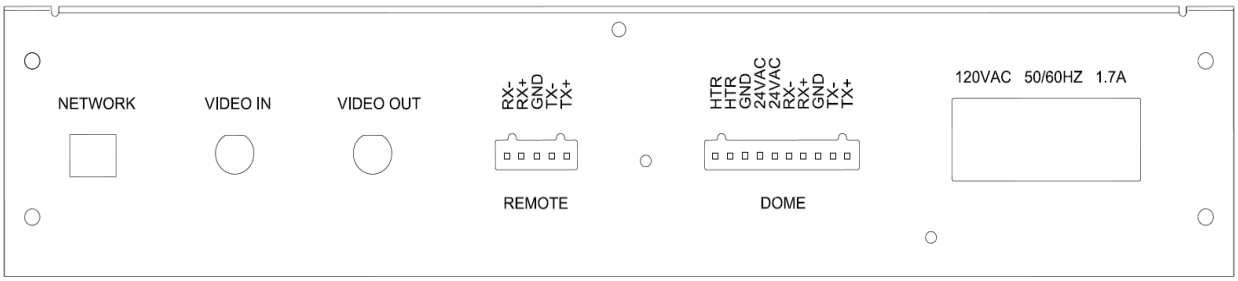
The front panel of the Field Box is shown below:



The '5 VOLTS' LED is lit when there is power to the Field Box unit. The 'REMOTE', 'JOYSTICK', and 'PC' LEDs indicate which controller, Remote, Joystick (RVS3000), or PC is the active controller of the dome. The 'TX DOME' LED is lit whenever data is transmitted to the Dome from any controller. The LED flickers as data is transmitted. The 'NETWORK' and 'STATUS' LEDs are controlled by the Axis 282 Encoder, if so equipped. Consult the 'USING THE AXIS 282 ENCODER' section for more details.

The front panel also includes 3 connectors. The first is a video BNC connector labeled 'MONITOR'. This provides a video output for a local video monitor. The second connector is an RJ-45 terminal labeled 'JOYSTICK'. This provides power and data connectivity to an external RVS3000 joystick controller. The last connector, a DB-9 connector labeled 'PC' is used to provide an RS-232 connection to a laptop PC. This can be used for dome control, or for uploading new firmware to the Field Box.

The back panel of the Field Box is shown below:



The back panel provides connections to the Dome as well as the Remote controller. The 120VAC power connection to the Field Box is also made at the back panel.

The 'CONTROL' terminal block provides data connections for the Remote (i.e. control room) controller. The 'DOME' terminal block provides data connections to the Dome, as well as power connections to the Dome and Dome Heater. The video from the Dome is connected to the 'VIDEO IN' BNC, while the video feed to the control room is provided by the 'VIDEO OUT' BNC. Note that if the Axis 282 Encoder is equipped, the 'VIDEO OUT' BNC will be non-functional, as this video signal is routed to the Axis Encoder. The 'VIDEO SERVER' RJ-45 is used to provide an Ethernet connection to the Axis 282 Encoder, if so equipped.

FIELD BOX CONNECTORS

Below is a list of all the external Field Box connectors, and a description of their functionality.

REMOTE 5-POSITION TERMINAL BLOCK: This terminal block is used to land data connections from the Remote controller. It is not used if the Axis 282 Encoder is installed.

DOME 10-POSITION TERMINAL BLOCK: This terminal block is used to land data and power connections to the Dome.

VIDEO IN BNC: This is the input for the video signal from the Dome.

VIDEO OUT BNC: This is the primary video output. It supplies the video signal to be routed to the Remote control area. It is not used if the Axis 282 Encoder is installed.

PC DB-9 CONNECTOR: This connector has two uses. The first use is for uploading new application firmware from a PC to the Field Box. The second use provides for local Dome control from a PC. If valid data is received on this port it will block the Remote and Joystick ports as long as valid data remains present on the port. Control will revert back to the Remote port after no data is received for a programmable timeout period.

JOYSTICK (RVS3000) RJ-45 CONNECTOR: This connector supplies power and data communications to an external RVS3000 Joystick controller. If valid data is received on this port it will block the Remote and Joystick ports as long as valid data remains present on the port. Control will revert back to the Remote port after no data is received for a programmable timeout period. This port is the primary port for setting up and configuring the Field Box user settings. See the section "SETTING UP THE FIELD BOX" for more information.

MONITOR OUTPUT BNC: This output provides a second video output for use with a local spot monitor.

DIP SWITCH SETTINGS

Switch bank S1 is used to set the address of the Field Box. The Field Box address should be set to the same value as the Dome. The address is a binary value from 0 to 255. To set a bit in the address, turn the corresponding switch position to ON.

For example, to set the Field Box address to 1 (binary 00000001), S1 should be set as follows: ADD-SW1 ON, ADD-SW2-ADD-SW8 OFF. To set the Field Box address to 173 (binary 10101101), S1 should be set as follows: ADD-SW1 ON, ADD-SW2 OFF, ADD-SW3 ON, ADD-SW4 ON, ADD-SW5 OFF, ADD-SW6 ON, ADD-SW7 OFF, and ADD-SW8 ON.

Switch bank S2 is used to set options for the Field Box. Position OP-SW8 is used to upload new firmware to the Field Box. If the Field Box is started up with OP-SW8 ON, the Field Box will run its boot code, which allows new application firmware to be uploaded to the Field Box. See the section "BOOT MODE AND APPLICATION CODE UPDATES" for more information.

Position OP-SW7 is used to select NTSC or PAL video. Set OP-SW7 to OFF for NTSC, and to ON for PAL. If the Field Box is equipped with an On-Screen-Display, it will generate a video signal of the desired standard if there is no video signal from the Dome.

Position OP-SW6 is used to select RS-485 or RS-232 for the Remote communication data lines. Set OP-SW6 to OFF for RS-485, and to ON for RS-232. When bringing in RS-232 data into the Remote terminal block J6, the RS-232 TX from the Remote should be placed in the RX- position on the terminal block, and the RS-232 RX to the Remote should be placed in the TX- position on the terminal block. Lastly, the RS-232 Ground connection should be placed in the SHIELD position on the terminal block. Jumper W12 should be installed in the Field Box main board (assembly 343100) to connect the RS-232 ground to the Field Box ground for proper operation.

When the Field Box is equipped with the Axis 282 Encoder, switch position OP-SW6 must be set to ON to enable RS-232 communication with the Axis Encoder. Jumper W12 is not required to be installed, as the Axis has a hard-wired ground connection. See the section "USING THE AXIS 282 ENCODER" for more information.

Positions OP-SW1 through OPT-SW5 are used to select the port protocol configuration. Consult the Port Protocol sections for more information on these switch settings.

PUSHBUTTON SWITCHES

Pushbutton S3 is used to reset the Field Box microcontroller U1. This is useful for uploading new firmware to the Field Box. See the section "BOOT MODE AND APPLICATION CODE UPDATES" for more information.

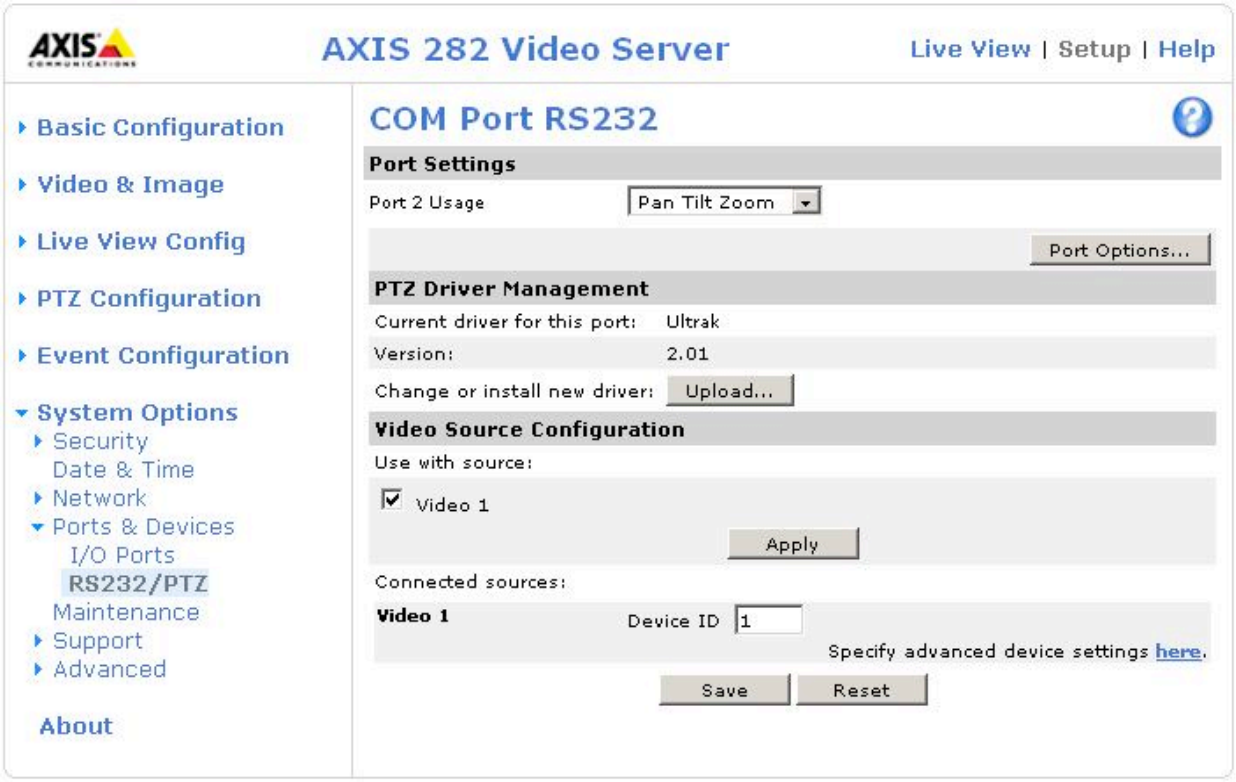
Pushbutton S4 performs the function of the CONTROL BUTTON on the Axis 282 Encoder, if so equipped. Pressing this button will restore the Axis Encoder settings to the factory defaults. Consult the Axis 282 user manual for more information.

USING THE AXIS 282 ENCODER

When the Axis 282 Encoder is equipped in the Field Box, the Remote terminal block J6 and Video Out BNC J8 should not be used. Dip switch S2 OP-SW6 must be set to ON to enable RS-232 communications with the Axis Encoder.

The Axis Encoder must be configured for RS-232 mode, and for the proper PTZ driver.

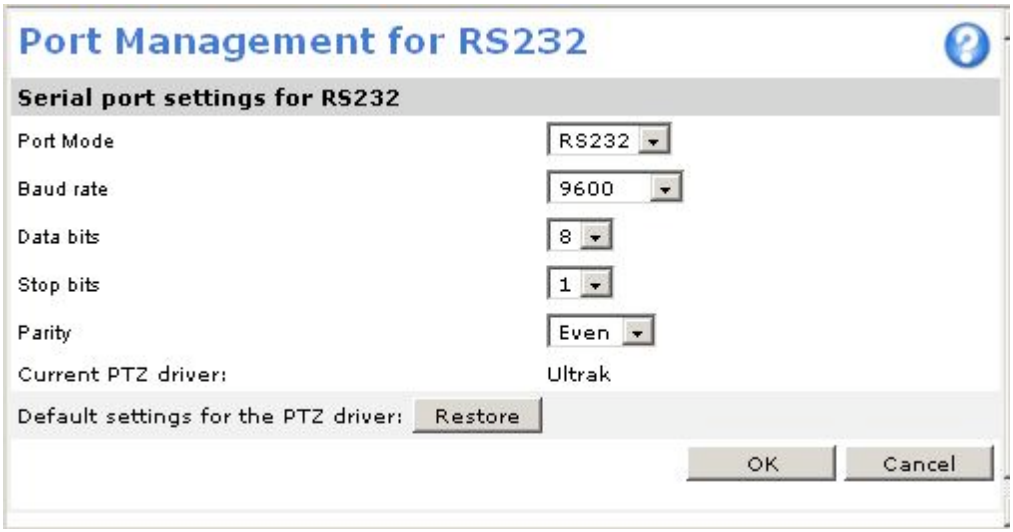
Select the 'Setup' option on the Axis browser, and then select the PTZ port under 'System Options>Ports & Devices'. The browser will display a page similar to this:



The PTZ driver is configured under 'PTZ Driver management'. Drivers for the various domes must be downloaded from the Axis website.

To configure the COM port for RS-232, first make sure 'Port 2 Usage' is set to 'Pan Tilt Zoom' under 'Port Settings'. Next, select 'Port Options...' to configure the port.

By doing so, the following dialog box will appear:



Make sure the 'Port Mode' is set to 'RS232'. The other options under this box should be set automatically by the PTZ driver, but verify that they are correct.

SELECTING RS-232 COMMUNICATIONS FOR THE REMOTE

To enable RS-232 mode for the Remote controller communications, first set switch S2 position OP-SW6 to ON to enable RS-232 mode. Next, install jumper W12 to connect the SHIELD position on the Remote terminal Block J6 to the Field Box ground. The RS-232 TX from the Remote should be placed in the RX- position on the terminal block, and the RS-232 RX to the Remote should be placed in the TX- position on the terminal block. Lastly, the RS-232 Ground connection should be placed in the SHIELD position on the terminal block.

SELECTING RS-485 2-WIRE FOR THE REMOTE

If the Remote requires RS-485 2-wire communications, wire jumpers must be placed in the Remote terminal block J6 between the RX and TX data lines. Place the Remote (+) data line in the RX+ position on the terminal block. Then place a wire jumper between the RX+ and TX+ positions on the terminal block. Next, place the Remote (-) data line in the RX- position on the terminal block. Finally, place a wire jumper between the RX- and TX- positions on the terminal block.

SELECTING RS-485 2-WIRE COMMUNICATIONS FOR THE DOME

Many domes only support RS-485 2-wire data communications. If such a dome is in use, and the controller in use requires data such as position data back from the dome, the dome data lines must be set to RS-485 2-wire on the Field Box.

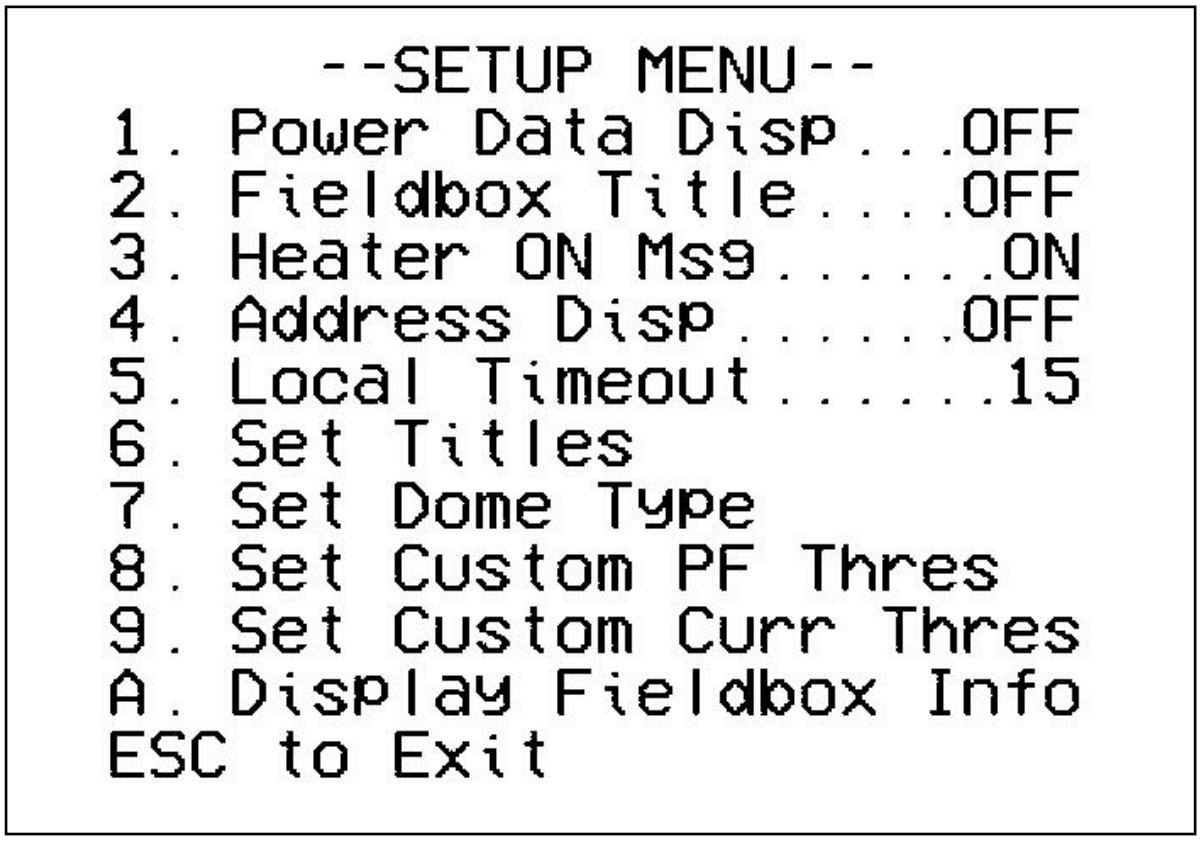
To select RS-485 2-wire communications for the dome, jumpers W14 and W15 must be installed to tie the Dome RX+ and TX+ data lines and Dome RX- and TX- data lines together.

Additionally, when in RS-485 2-wire mode jumpers W7, W8, and W9 should not be used. Use only jumpers W4, W5, and W6 if termination or strong pullup/pulldown resistors are desired on the Dome data lines. If jumpers are installed on both W4,W5,W6 and W7,W8,W9, communication with the Dome may be disrupted.

SETTING UP THE FIELD BOX

The Field Box is set up using the RS3000 through the JOSTICK RJ-45 port on the front panel. The RVS3000 must be addressed to the address set on the Field Box Address DIP switch S1.

All user-selectable features can be accessed through the main setup menu. This setup menu is displayed by issuing a "Go To Preset 20" command on the RVS3000. The first page of the setup menu is shown below:



To select items in the menu, the RVS3000 must be equipped with an external PC keyboard.

Press '1' on the external keyboard to toggle the Power Draw Information screen. The status is immediately updated and stored in the Field Box non-volatile memory.

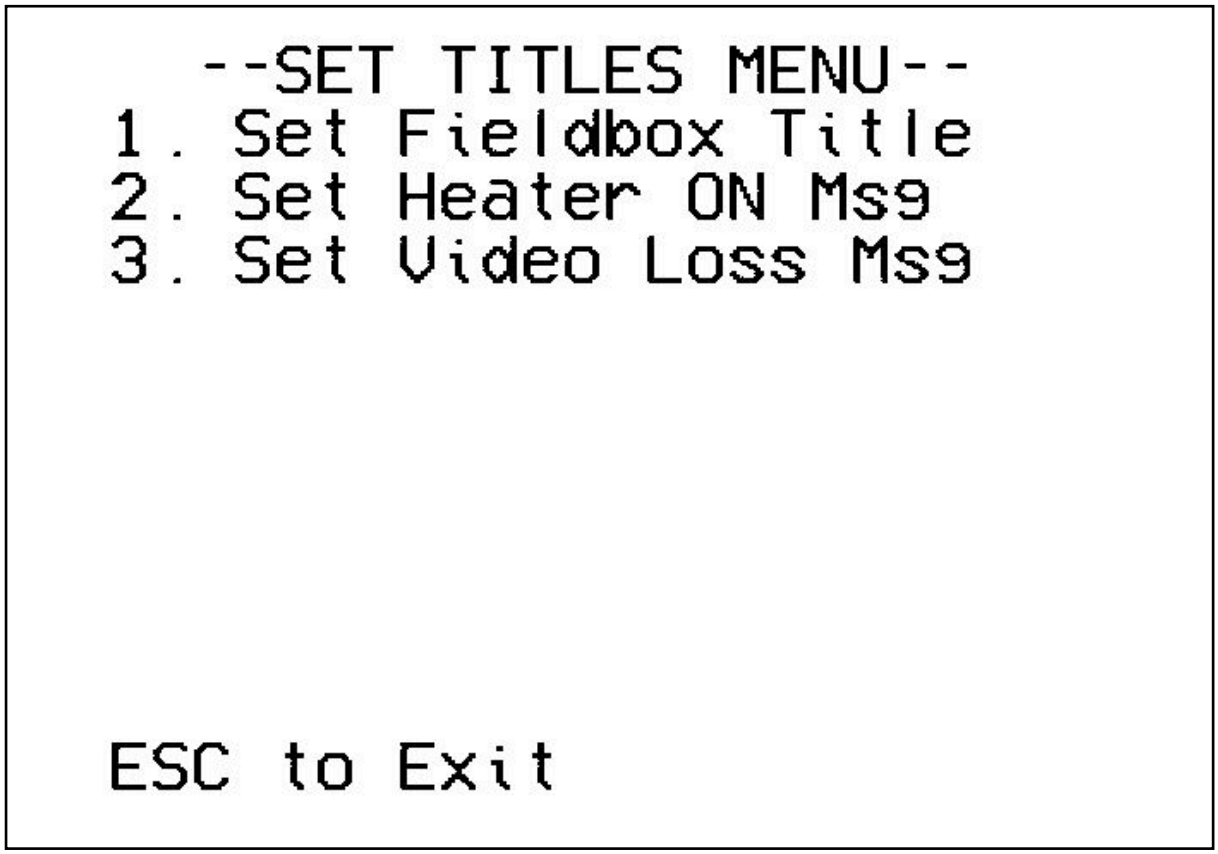
Press '2' on the external keyboard to toggle the Field Box Title display. The Field Box Title is a user-defined alphanumeric title that is displayed near the top of the screen. The status is immediately updated, and stored in the Field Box non-volatile memory.

Press '3' on the external keyboard to toggle the Heater ON display. The Heater ON Message is a user-defined alphanumeric message that is displayed when the Field Box determines that the Dome's heater is on. It is displayed near the bottom of the screen. The status is immediately updated and stored in the Field Box non-volatile memory.

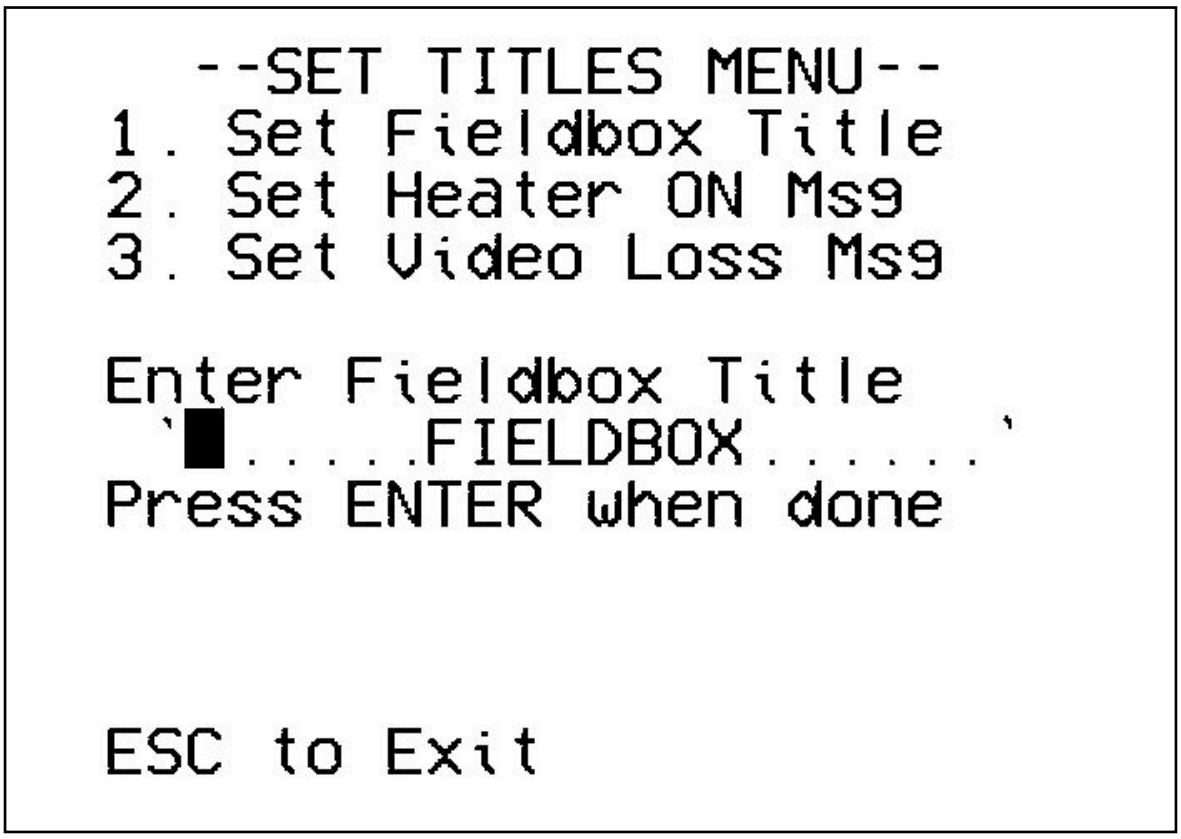
Press '4' on the external keyboard to toggle the Field Box Address display. The Field Box Address displays the address as set on the address DIP switch S1. It is displayed near the bottom of the screen. The status is immediately updated and stored in the Field Box non-volatile memory.

Press '5' on the external keyboard to change the Local Timeout time value. This sets the number of seconds to wait after no more data is received from a local controller (JOYSTICK, PC) before reverting control back to the REMOTE. The values are 5, 15, 30, and 60 seconds. Each time '5' is pressed, the value is increased to the next possible value. The value goes back to 5 seconds if '5' is pressed while set to 60 seconds. The status is immediately updated and stored in the Field Box non-volatile memory.

As stated above, the Field Box Title, Heater ON Message, and always-enabled Video Loss Message are user definable. Press '6' to bring up the following menu that allows these titles and messages to be set:



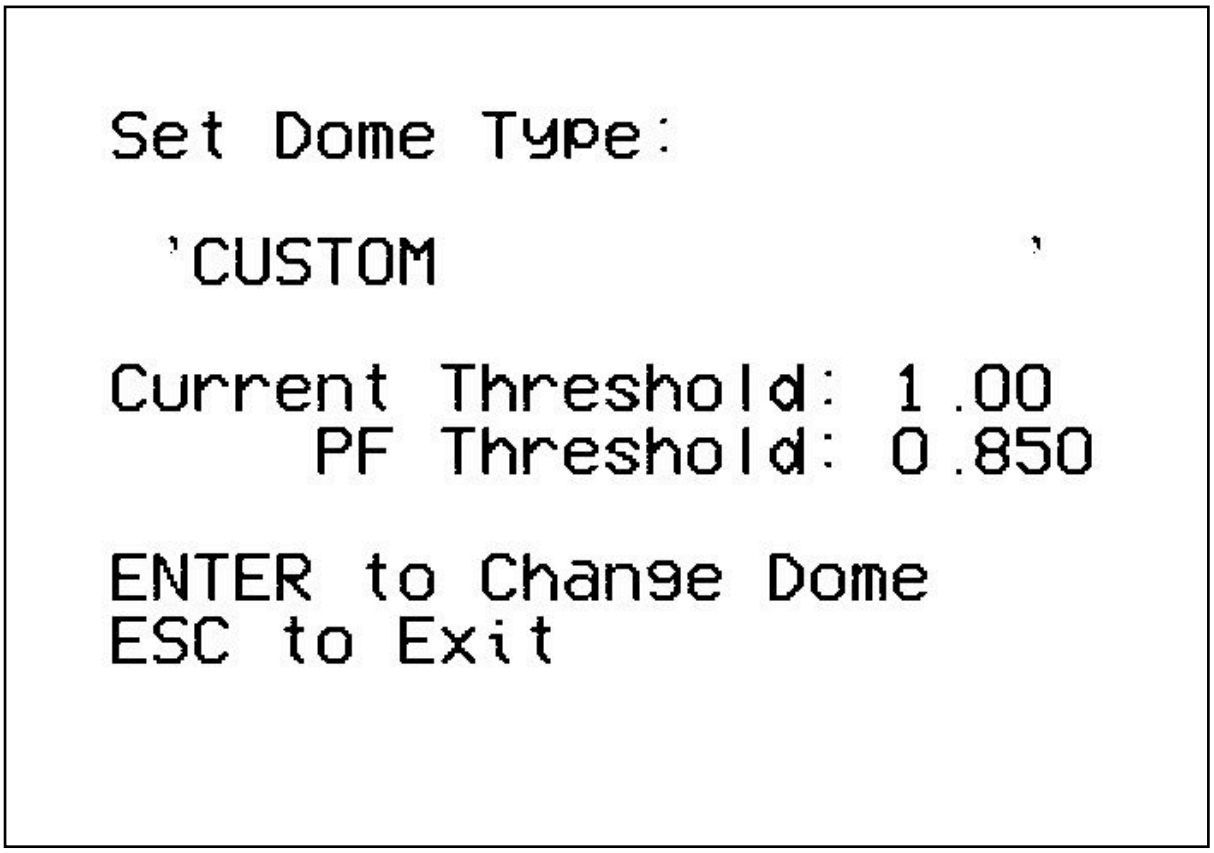
Press 1' on the external keyboard to set the Field Box Title. The display will change to the following:



Use the external keyboard to enter the desired title. The arrow keys can be used to move the cursor. When the desired title has been entered, press the ENTER key to save the changes to the title. The screen will revert back to the original 'Set Titles Menu' display. Press ESC to discard the changes and to revert back to the original 'Set Titles Menu' display.

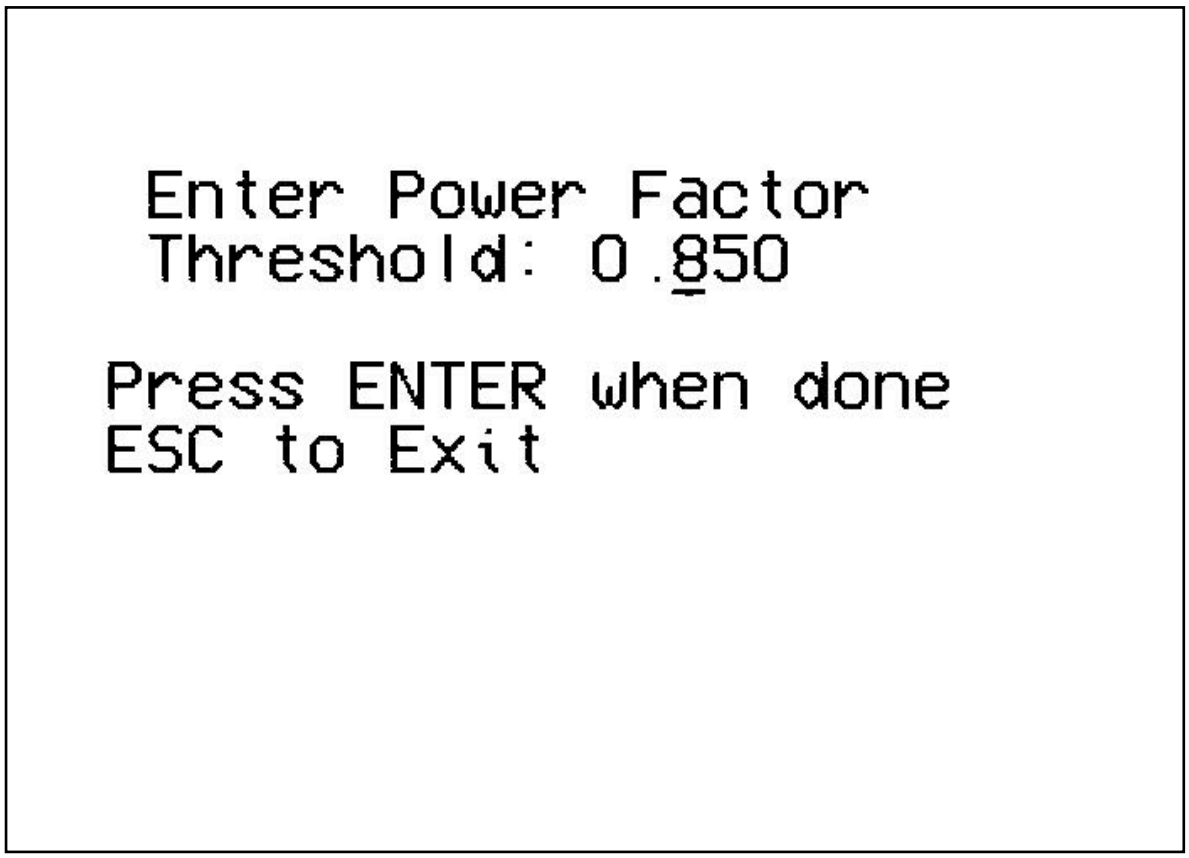
The Heater ON Message (press '2') and Video Loss Message (press '3') can be set in the same manner. Press ESC from the Set Titles menu to revert back to the main setup menu.

From the main setup menu, press '7' on the external keyboard to bring up the 'Set Dome Type' menu. This menu is shown below:



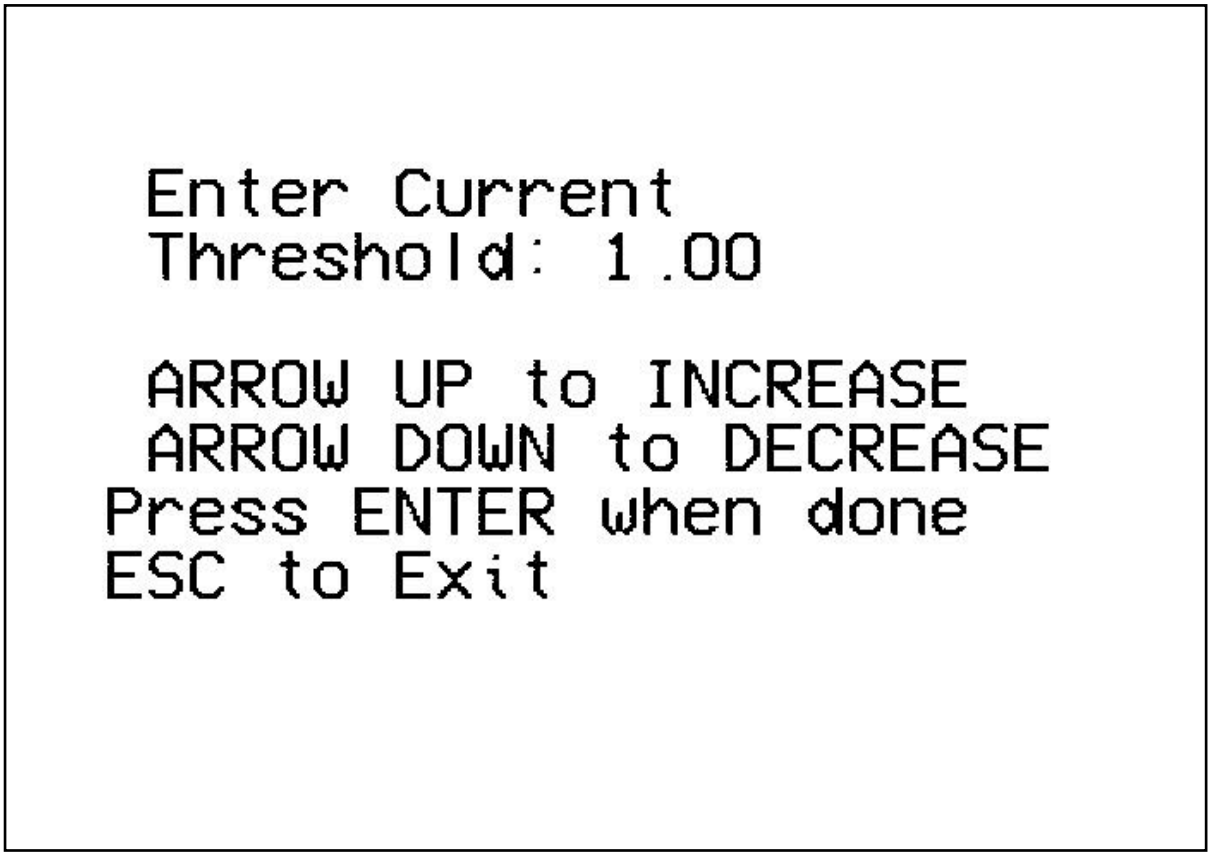
Use this menu to select the type of Dome that is powered from the Field Box. Pressing ENTER on the external keyboard will cycle through all the supported dome types, as well as a 'CUSTOM' setting. This menu selection sets the power factor and minimum current draw thresholds which are used by the Field Box to determine when the Dome's heater is on. The CUSTOM setting allows the user to define the power factor and current thresholds for the dome. Press ESC on the external keyboard to revert back to the main setup menu when done.

From the main setup menu, press '8' on the external keyboard to bring up the 'Set Custom Power Factor Threshold' menu. This menu is shown below:



Use the external keyboard to enter the desired power factor threshold. The measured Dome power factor must be above this threshold value in order to consider the Dome heater to be on. Typically, a dome with the heater off will have a power factor less than 0.800. When the heater is on, the power factor will increase to a value above 0.800, or even higher. The value of 0.850 is a good starting point for an unknown dome. Press ENTER to accept and store the set value, and to revert back to the main setup menu. Press ESC to discard changes and to revert back to the main setup menu.

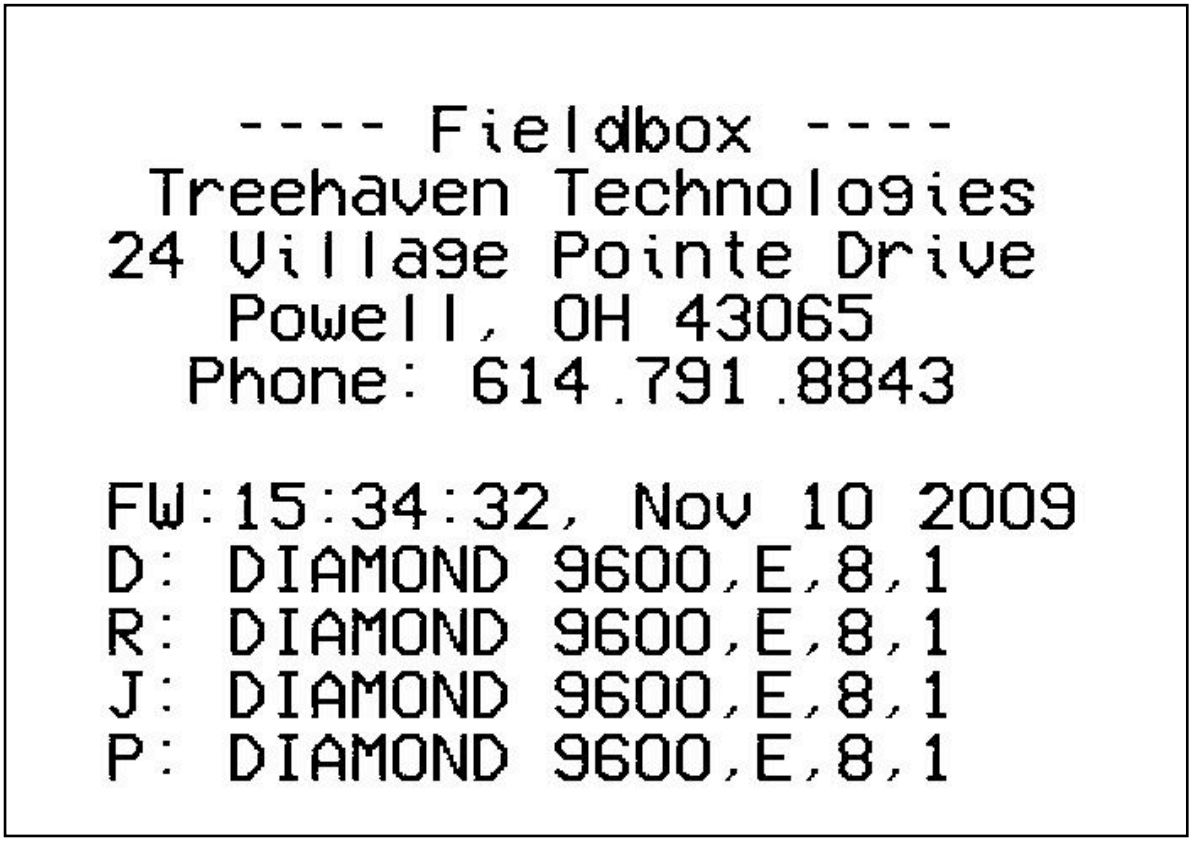
From the main setup menu, press '9' on the external keyboard to bring up the 'Set Custom Current Threshold' menu. This menu is shown below:



Use the UP arrow on the external keyboard to increase the threshold, and the DOWN arrow to decrease the threshold. This current threshold provides a second criteria to determine if the Dome's heater is on. It should be set to a little less than the heater current draw specified in the dome's manual. It is used to reduce false positives that might occur if the heater status was determined by power factor alone.

Press ENTER to accept and store the set value, and to revert back to the main setup menu. Press ESC to discard changes and to revert back to the main setup menu.

From the main setup menu, press 'A' on the external keyboard to bring up the Field Box Information screen. This screen displays contact information for Treehaven Technologies, the build date and time for the firmware, and the port setup for the Field Box. An example of the Information screen is shown below:



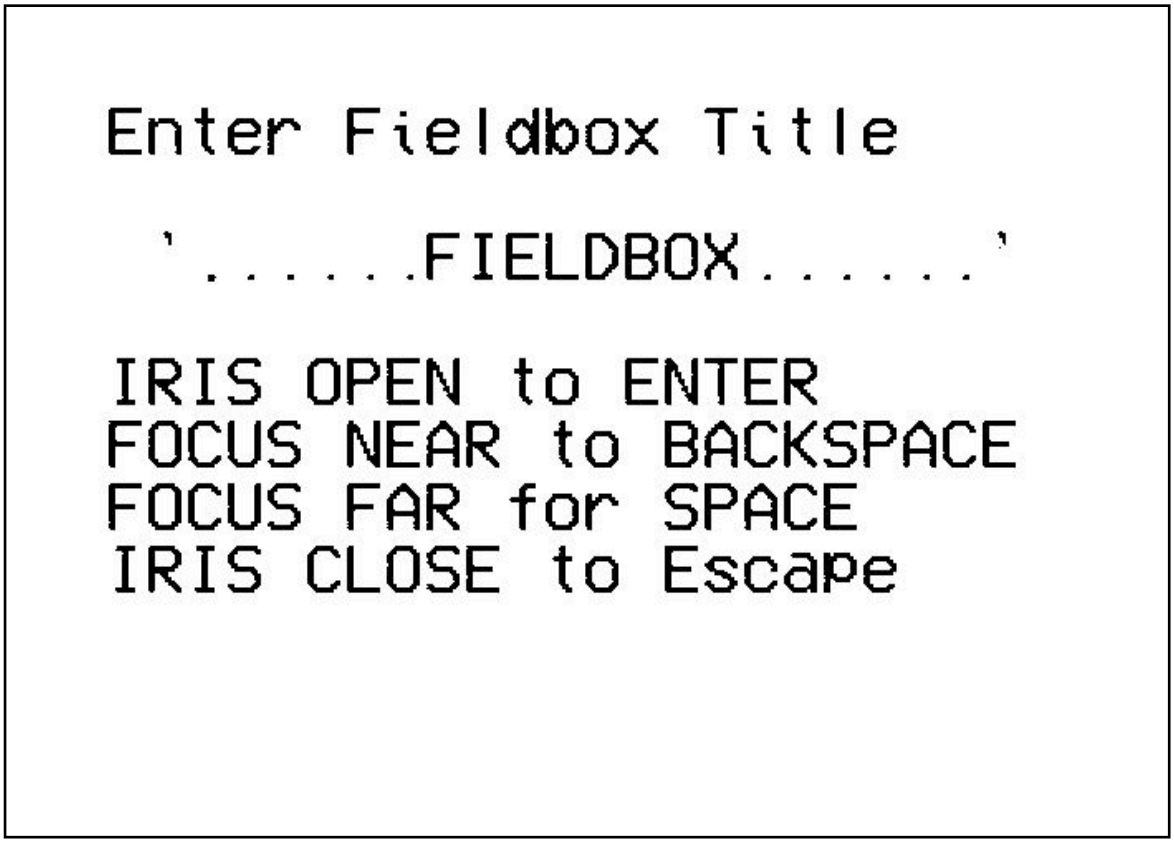
Press ESC on the external keyboard when done. This will revert back to the main setup menu.

To exit completely from the setup menu, press ESC on the external keyboard while displaying the main setup menu screen.

The Field Box can also be setup without an external 'QWERTY' PC keyboard. The following presets can be used with the RVS3000 Joystick.

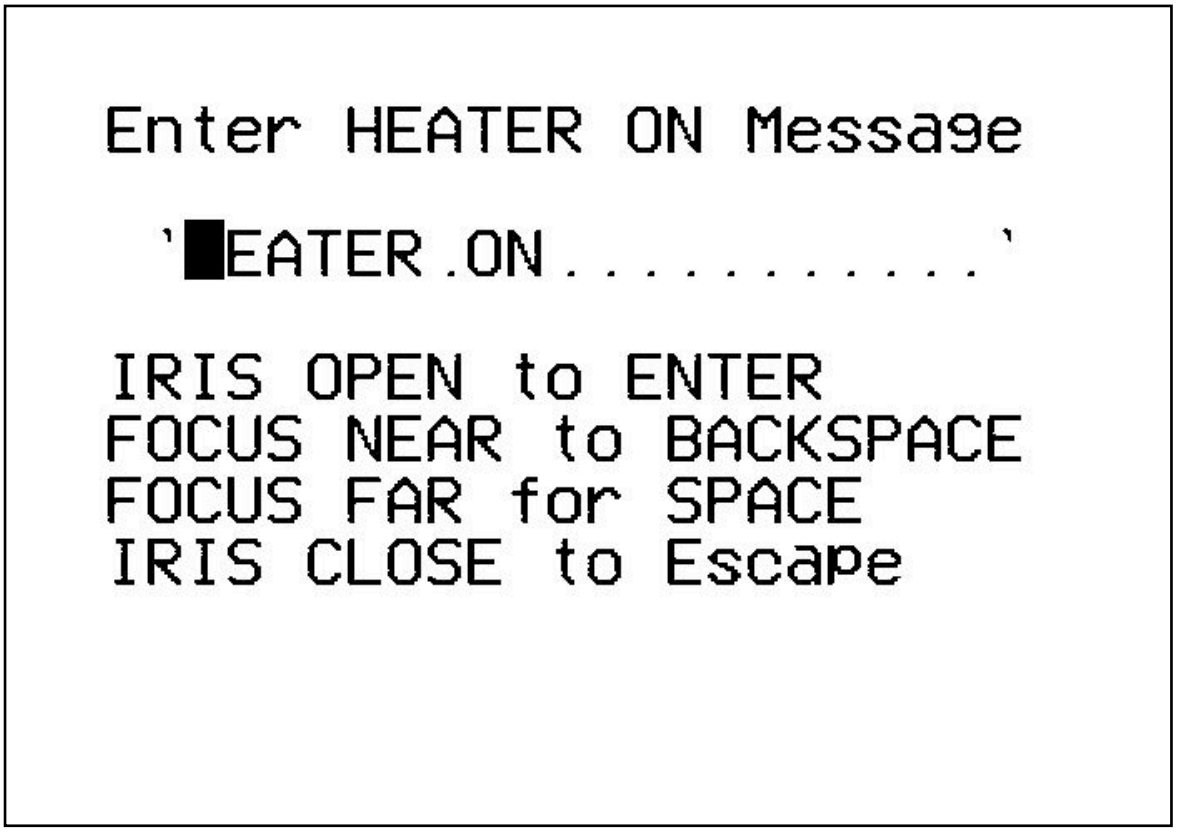
Go To Preset 21: This calls up the joystick controlled Field Box setup menu. This is supported for all controllers. The menu is navigated using the joystick and the iris open/close commands.
Go To Preset 22: This calls up a joystick controlled screen to program the Field Box Title string. The joystick is used, as well as iris open/close and focus near/far.
Go To Preset 23: This calls up a joystick controlled screen to program the Heater ON string. The joystick is used, as well as iris open/close and focus near/far.

To set the Field Box Title, issue the "Go To Preset 24" command on the RVS3000. The following screen will be displayed:



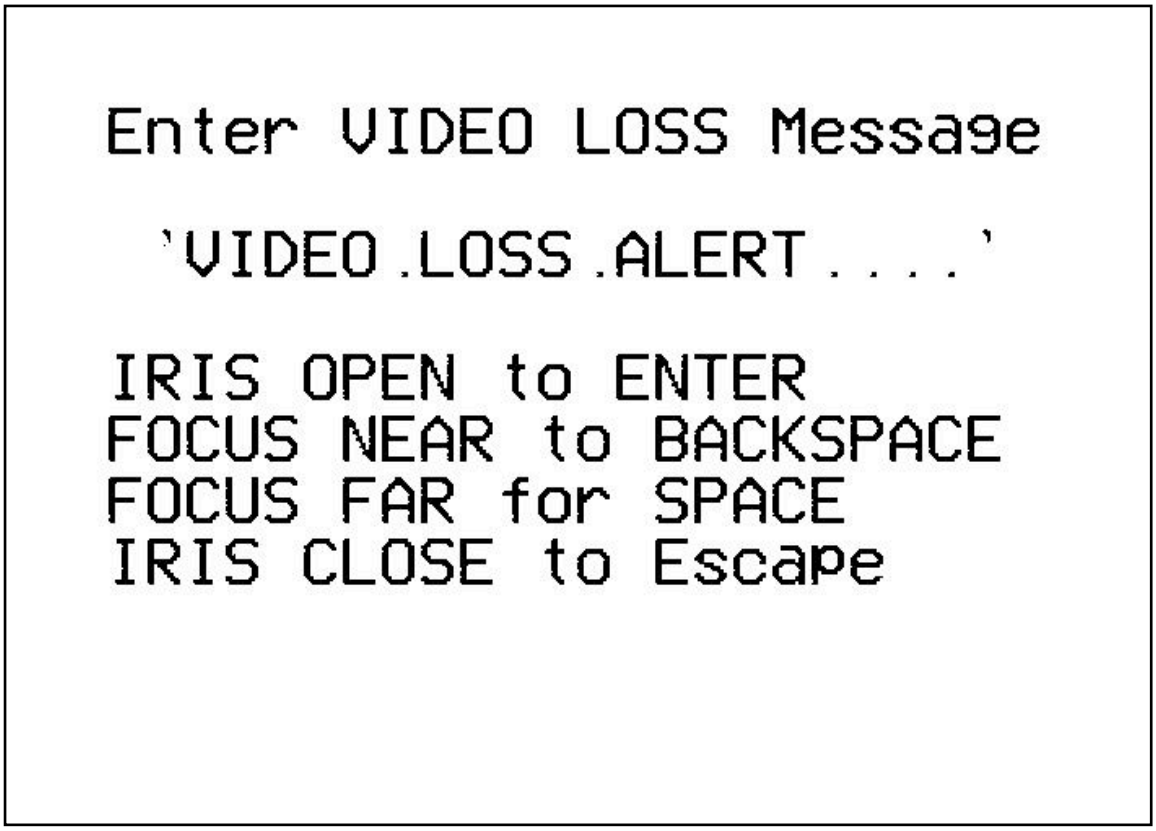
Use the RVS3000 to move the cursor left and right. Up and down on the joystick will increment or decrement the character under the cursor. The FOCUS NEAR button will perform the BACKSPACE function, while the FOCUS FAR button will enter a space at the cursor. To exit and save changes, issue an IRIS OPEN command. To discard changes, enter an IRIS CLOSE command.

To set the Heater ON message, issue the "Go To Preset 25" command on the RVS3000. The following screen will be displayed:



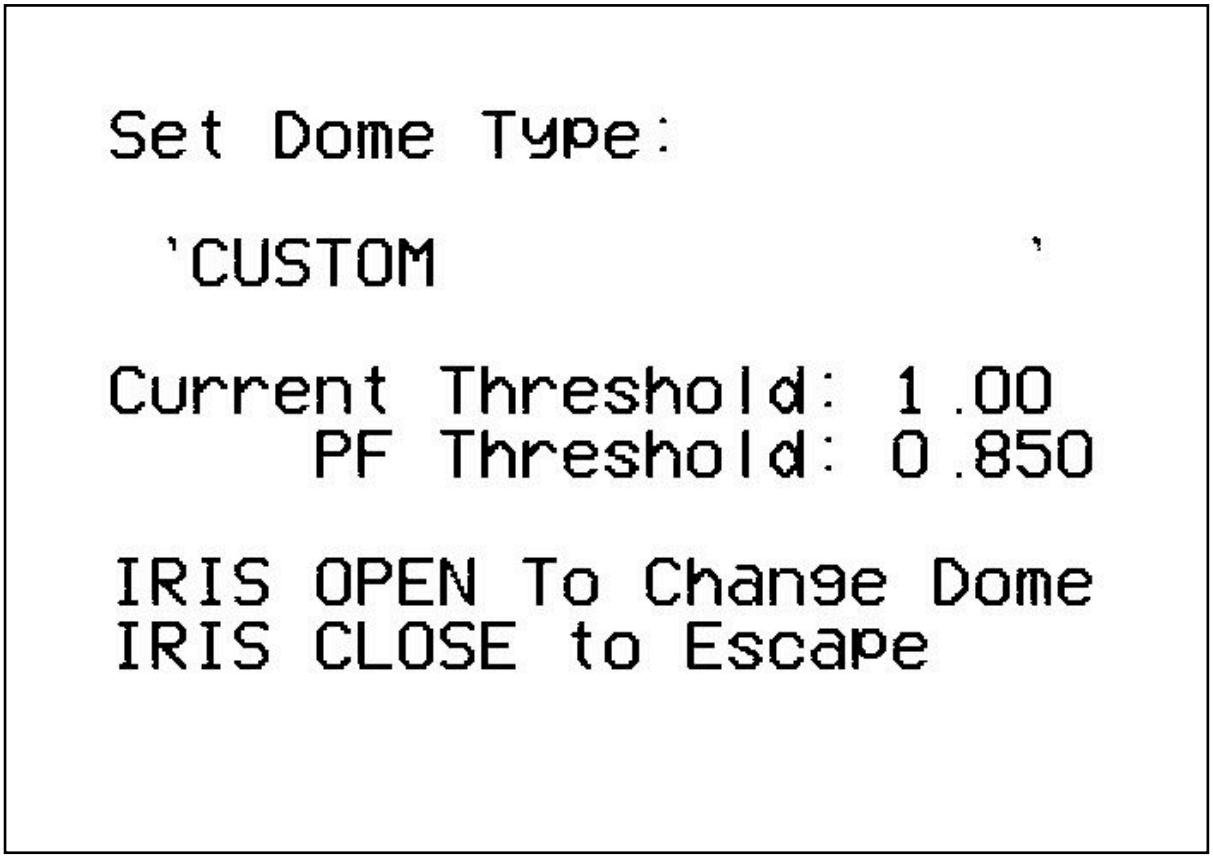
Use the RVS3000 to move the cursor left and right. Up and down on the joystick will increment or decrement the character under the cursor. The FOCUS NEAR button will perform the BACKSPACE function, while the FOCUS FAR button will enter a space at the cursor. To exit and save changes, issue an IRIS OPEN command. To discard changes, enter an IRIS CLOSE command.

To set the Video Loss message, issue the "Go To Preset 26" command on the RVS3000. The following screen will be displayed:



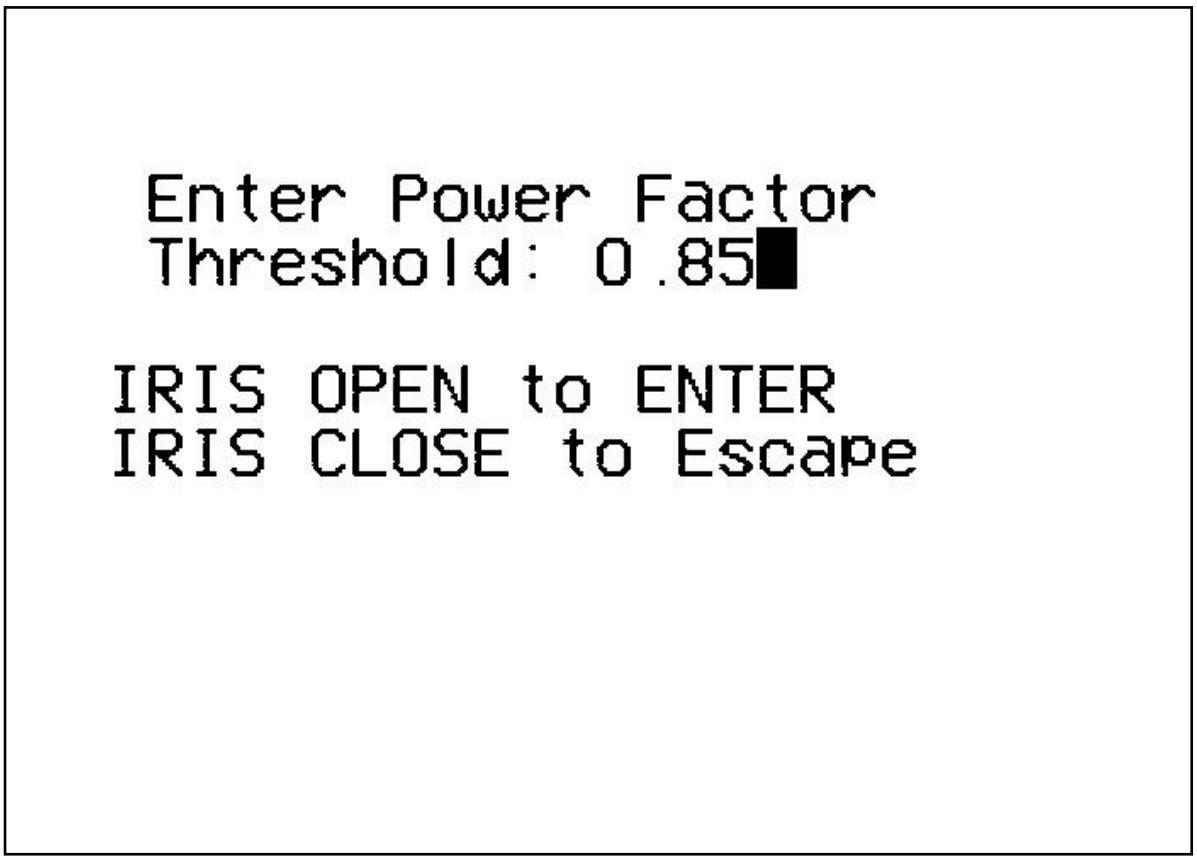
Use the RVS3000 to move the cursor left and right. Up and down on the joystick will increment or decrement the character under the cursor. The FOCUS NEAR button will perform the BACKSPACE function, while the FOCUS FAR button will enter a space at the cursor. To exit and save changes, issue an IRIS OPEN command. To discard changes, enter an IRIS CLOSE command.

To set the Dome Type, issue the "Go To Preset 27" command on the RVS3000. The following screen will be displayed:



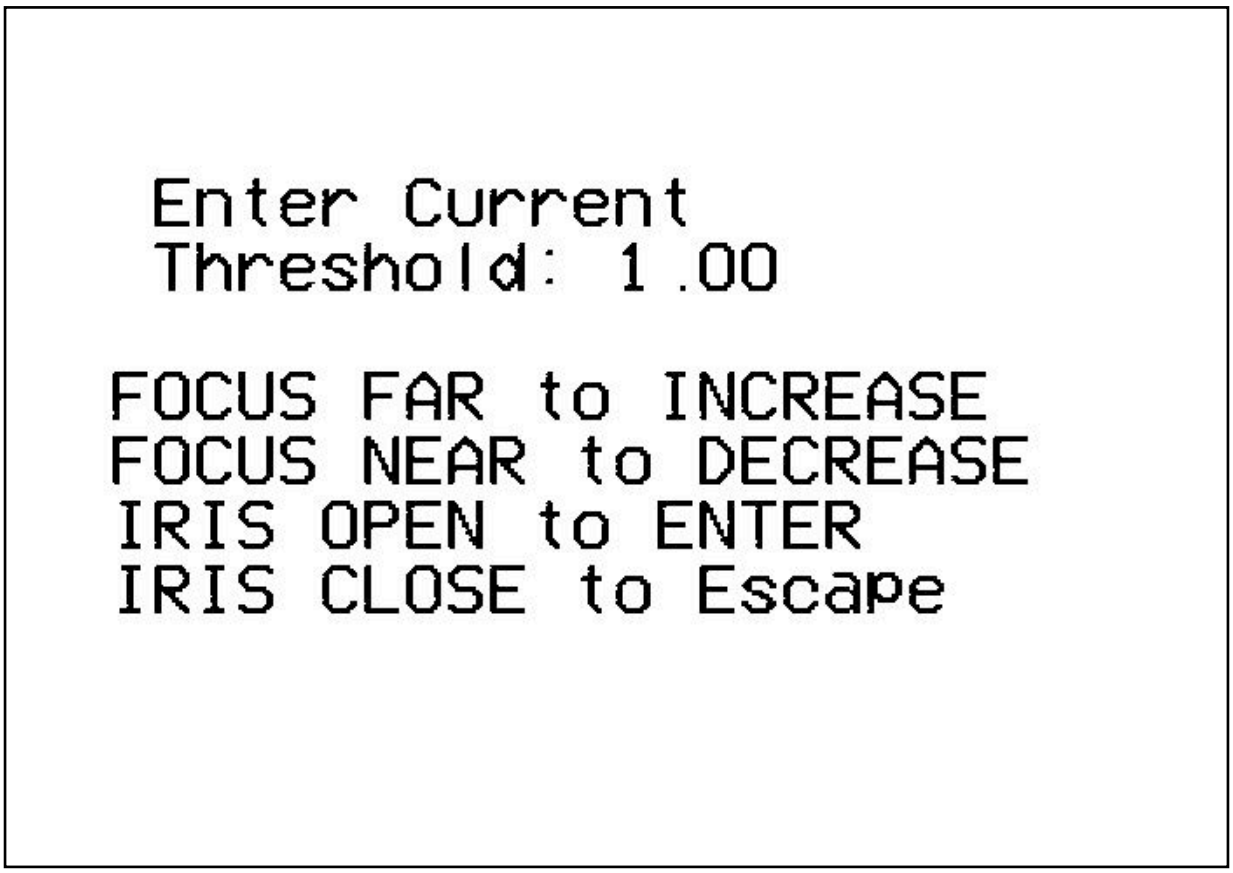
To change the Dome Type, issue an IRIS OPEN command. To save changes and exit, enter an IRIS CLOSE command.

To set the Custom Dome Power Factor Threshold, issue the "Go To Preset 28" command on the RVS3000. The following screen will be displayed:



Use the RVS3000 to move the cursor left and right. Up and down on the joystick will increment or decrement the numeral under the cursor. To exit and save changes, issue an IRIS OPEN command. To discard changes, enter an IRIS CLOSE command.

To set the Custom Dome Current Threshold, issue the "Go To Preset 29" command on the RVS3000. The following screen will be displayed:

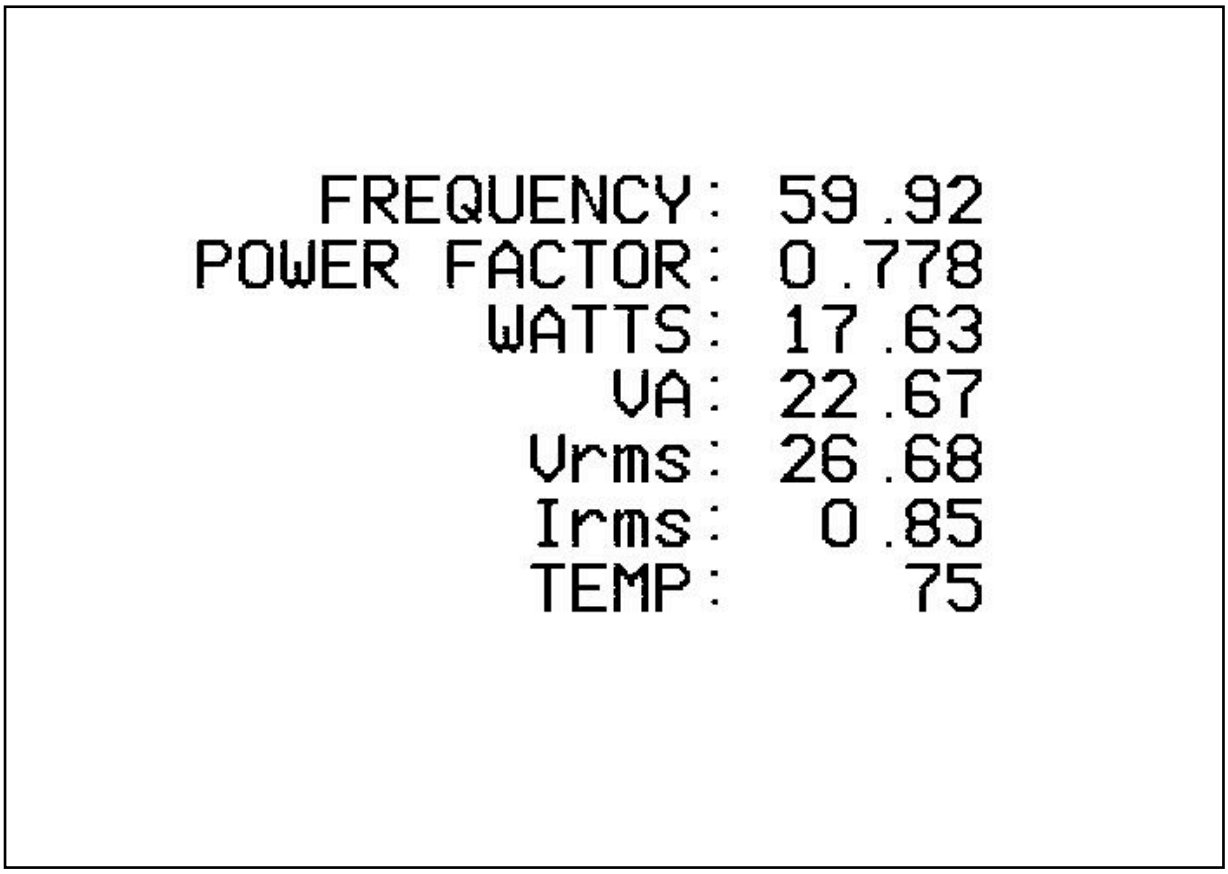


To increment the current threshold by 0.25A, press FOCUS FAR on the RVS3000. To decrement the current threshold by 0.25A, press FOCUS NEAR on the RVS3000. To exit and save changes, issue an IRIS OPEN command. To discard changes, enter an IRIS CLOSE command.

DISPLAYING THE DOME POWER DRAW INFORMATION

The Field Box monitors the Dome's power draw in order to determine if the Dome's heater is on or off. The heater status can then be displayed on-screen. The Field Box can also display information about the Dome's power draw, which can be useful in monitoring the Dome's performance and system health.

The Power Draw Information screen looks like the following:



The FREQUENCY data item is the measured frequency of the AC input, measured in Hertz. In the United States this value should be very close to 60 Hz.

The POWER FACTOR data item is the calculated power factor of the Dome's power draw. The power factor is the ratio of the real power consumed by the dome (WATTS) to the total apparent power consumed by the dome (VA). When the Dome's heater is off, the power factor remains essentially constant regardless of the Dome's current draw. When the Dome's heater is turned on, however, the power increases in a measurable, and for some dome models, a significant amount. The power factor is a unitless measurement.

The WATTS data item is the real, non-reactive portion of the total power draw of the Dome. This value will never be greater than the VA value. The value displayed is measured in units of Watts.

The VA data item displays the Dome's total real and reactive power draw. It is calculated by multiplying the rms voltage supplying the Dome by the Dome's rms current draw. The value

displayed is measured in units of Volt-Amperes.

The Vrms data item is the true root-mean-square measurement of the AC voltage supplied to the Dome. The units are Volts.

The Irms data item is the true root-mean-square measurement of the AC current drawn by the Dome. The units are Amperes.

The TEMP data item displays an approximate temperature measurement performed by the Power Monitor device on the Field Box main circuit board. This temperature measurement shows the approximate temperature inside the Field Box case. The units are degrees Fahrenheit.

The Dome Power Draw Information screen is toggled by sending a "Go To Preset 1" command to the Field Box from the RVS3000. The RVS3000 must be set to control the camera address that is set on the Field Box address dip switch S1. The Dome Power Draw Information screen can also be accessed from the Remote and PC controller ports. Consult the appropriate protocol sections for information on how to do so.

OPERATION OF THE LEDs

The LEDs on the Field Box main board (Assembly 343100) operate as follows:

LED1 (D1) -- this LED is currently unused.
LED2 (D2) – This LED is on when the Power Monitor IC has dome power data ready for the Field Box microcontroller to read. The LED should illuminate briefly approximately once every 4 seconds.
LED3 (D3) -- This LED is on while the Field Box microcontroller is processing the data it received from the Power Monitor IC. The LED should illuminate briefly approximately once every 4 seconds.
LED4 (D4) -- This LED blinks on and off to indicate the microcontroller is operational. It is on for 1 second, then off for 1 second.

These four LEDs (D1-D4) run through a startup sequence upon power-up. Upon power-up, each LED from 1 to 4 is lit individually for 0.25 seconds.

FLASH LED (D6): This LED is lit while new firmware is being flashed into the Axis 282 Encoder. Consult the Axis 282 manual for more information.

NETWORK LED (D11): This red LED is used in conjunction with the NETWORK LED (D6) on the front panel to indicate the status of the Axis 282 Encoder's network connection, if so equipped. This LED will illuminate during startup. After startup, if this LED and the green NETWORK LED on the front panel are both lit, the Axis Encoder has a 10 Mbit/S network connection. If this LED is unlit while the green NETWORK LED on the front panel is lit, the Axis Encoder has a 100 Mbit/S network connection. If the green NETWORK LED (D6) on the front panel is unlit, and this LED is flashing rapidly, then the Axis Encoder has experienced a hardware error.

STATUS LED (D12): This red LED flashes rapidly if there is an Axis 282 Encoder hardware error.

The LEDs on the Field Box front panel operate as follows:

POWER LED (D1): This LED is illuminated when there is power to the Field Box. It is lit from the Field Box's internal 5 VDC supply.

REMOTE LED (D2): This LED is lit when the Remote connection is the active controller for the Dome.

JOYSTICK LED (D3): This LED is lit when the Joystick (RVS3000) connection is the active controller for the Dome.

PC LED (D4): This LED is lit when the PC (RS-232 DB9) connection is the active controller for the Dome.

TX_TO_DOME LED (D5): This LED is lit when data is transmitted to the dome, from any controller source. Whenever data is received from the active controller, the Field Box first ensures that it is a valid data packet as defined by the active protocol before sending the packet on to the dome.

NETWORK LED (D6): This LED is driven from the Axis 282 Encoder, if so equipped. This LED is steadily lit for a network connection. It flashes for network activity. The status of this LED and the NETWORK LED (D11) on the main board combine to show the speed of the network connection.

STATUS LED (D7): This LED is driven from the Axis 282 Encoder, if so equipped. This LED indicates that the Axis encoder is operating normally. It can be programmed to flash when the camera is accessed.

JUMPER LIST

W1 – This jumper terminates (120 Ohms) the RX from Joystick data lines.

W2 – This jumper connects the TX+ to Joystick data line to the Joystick's RX+ data line.

W3 – This jumper connects the TX- to Joystick data line to the Joystick's RX- data line.

W4 – This jumper selects a strong pulldown resistor (1K) for the RX- from Dome data line.

W5 – This jumper terminates (120 Ohms) the RX from Dome data lines.

W6 – This jumper selects a strong pullup resistor (1K) for the RX+ from Dome data line.

W7 – This jumper selects a strong pulldown resistor (1K) for the TX- to Dome data line.

W8 – This jumper terminates (120 Ohms) the TX to Dome data lines.

W9 – This jumper selects a strong pullup resistor (1K) for the TX+ to Dome data line.

W10 - This jumper terminates (120 Ohms) the RX from Remote data lines.

W11 - This jumper terminates (120 Ohms) the TX to Remote data lines.

W12 – This jumper ties the Remote Shield connection to GND, to be used when the Remote communications are RS-232

W13 – This is not a user-settable jumper.

W14 – This jumper connects the TX+ to Dome data line to the RX+ From Dome data line, which is done to set the dome data lines to RS-485 2-wire.

W15 – This jumper connects the TX- to Dome data line to the RX- From Dome data line, which is done to set the dome data lines to RS-485 2-wire.

PORT PROTOCOL CONFIGURATION

Option switch OPT-S2 positions 1 through 5 are used to select the port protocol configuration of the Field Box ports. The following table shows the valid DIP switch settings and their corresponding port configurations:

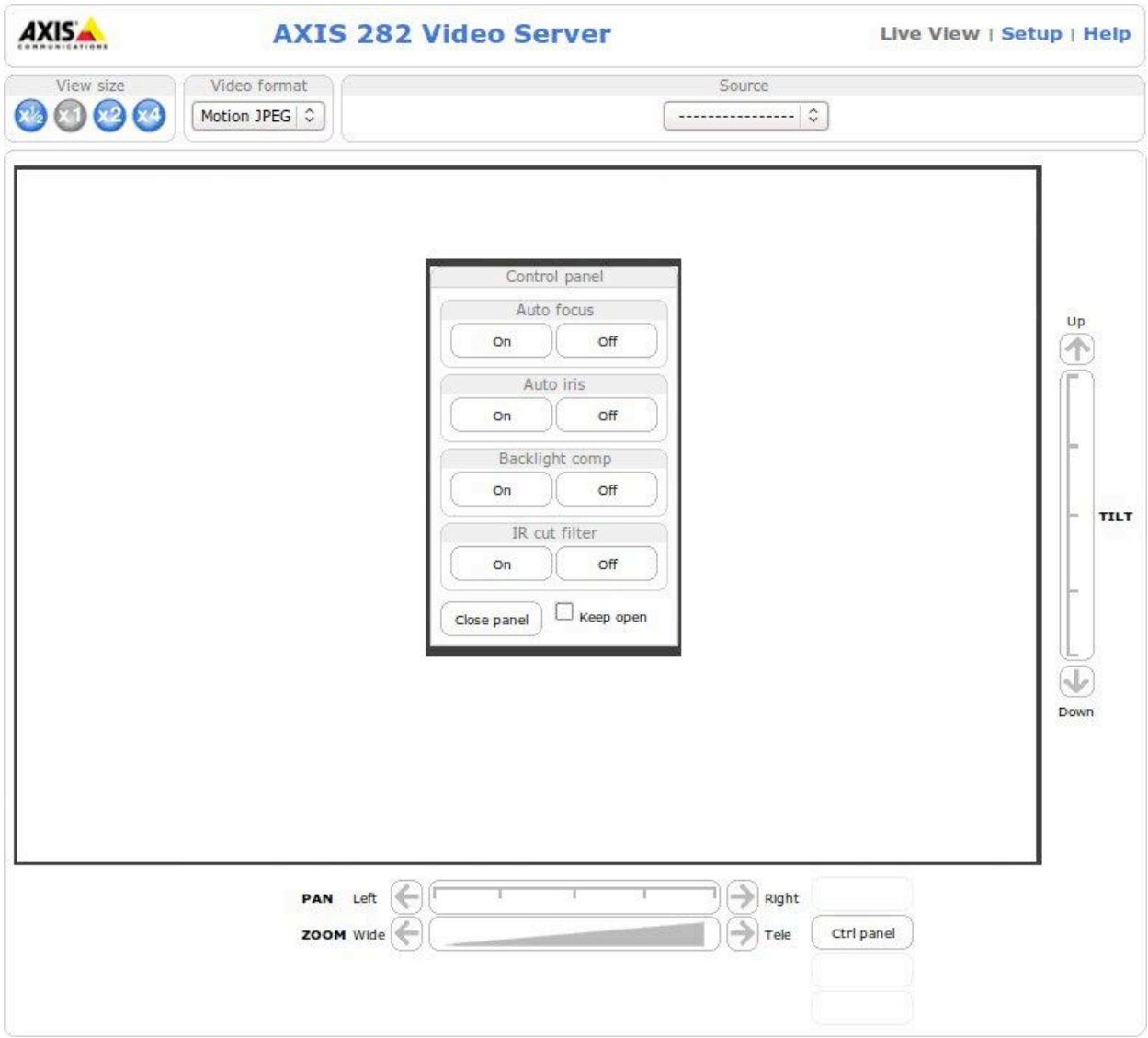
	OPT-S2 DIP POSITION					FIELD BOX PORT			
	1	2	3	4	5	DOME	REMOTE	PC	JOYSTICK
OPTION 1	OFF	OFF	OFF	OFF	OFF	DIAMOND 9600 E, 8, 1	DIAMOND 9600 E, 8, 1	DIAMOND 9600 E, 8, 1	DIAMOND 9600 E, 8, 1
OPTION 2	ON	OFF	OFF	OFF	OFF	VICON VPN 19.2K N, 8, 1	PELCO D 2400 N, 8, 1	VICON VPN 19.2K N, 8, 1	DIAMOND 9600 E, 8, 1
OPTION 3	OFF	ON	OFF	OFF	OFF	VICON VPN 19.2K N, 8, 1	VICON VPN 19.2K N, 8, 1	VICON VPN 19.2K N, 8, 1	DIAMOND 9600 E, 8, 1
OPTION 4	ON	ON	OFF	OFF	OFF	PELCO D 2400 N, 8, 1	PELCO D 2400 N, 8, 1	PELCO D 2400 N, 8, 1	DIAMOND 9600 E, 8, 1

Unsupported configurations will default to the configuration of OPTION 1.

PORT PROTOCOL SELECTION OPTION 1

This option utilizes Diamond protocol on all 4 Field Box ports. Diamond protocol operates at 9600 bps, 8 data bits, Even parity, and 1 stop bit. Ensure that all controllers are set to these same communication parameters.

To toggle the Power Draw Information screen issue a "Go To Preset 1" command from any controller. The Power Draw Information screen can also be enabled/disabled using the "Ctrl panel" function "Backlight comp" when using the Axis 282 Encoder. Enable the control panel by clicking on the 'Ctrl panel' button on the browser. "Backlight comp" ON enables the Power Draw Information screen, while "Backlight comp" OFF disables the Power Draw Information screen. The Axis browser



screen is shown below, with the "Control panel" enabled.

PORT PROTOCOL SELECTION OPTION 2

This configuration utilizes Pelco D protocol on the REMOTE port, Vicon VPN protocol on the PC port, and Diamond protocol on the RVS3000 JOYSTICK port. The DOME port outputs Vicon VPN protocol.

Both Vicon VPN ports are set for 19.2 kbps, 8 data bits, no parity, and 1 stop bit. The Pelco D port is set for 2400 bps, 8 data bits, No parity, and 1 stop bit. The Diamond protocol port is set for 9600 bps, even parity, and 1 stop bit.

Ensure that all controllers are set to the proper communication parameters. Also ensure that the dome is set to Vicon VPN protocol. On a Surveyor dome, this is accomplished by setting switch SW2 to positions 1 and 3 ON, and all others OFF. The dome will start up in 'autobaud' detection mode. Send data to the dome using the RVS3000 in order to cause the dome to select 19.2 kbps.

The following procedures are used to toggle the Power Draw information screen:

REMOTE Pelco D port: From the Axis web browser, call up the Control Panel. Use the "Backlight" ON/OFF controls to turn on and off the Power Draw display screen. Recalling Preset 1 will also toggle the Power Draw display screen.

PC Vicon VPN port: Recalling Preset 1 will toggle the Power Draw display screen.

JOYSTICK RVS3000 port: Toggle the Power Draw information screen by issuing a "Go To Preset 1" command.

The PC port and Joystick port can be used to configure the dome as well. To configure the dome using the PC port and the Vicon control software, consult the Vicon Operation and Programming manual for the dome. To configure the dome using the RVS3000, issue a "Set Preset 94" command to call up the dome setup menu. The menu is navigated using the joystick and the Vicon VPN 'auto iris' and 'auto pan' commands. The 'auto iris' command is invoked by the RVS3000 by issuing a "Go To Preset 92" command. The 'auto pan' command is invoked by the RVS3000 by issuing a "Go To Preset 93" command.

To select Iris modes, issue a "Go To Preset 92" command from the RVS3000 to enable or disable Auto Iris mode. To select the iris mode from the Axis web browser use the control panel to send an Auto Iris ON or OFF command (either will work). Each time a command is issued, the mode will toggle.

PORT PROTOCOL SELECTION OPTION 3

This configuration utilizes Vicon VPN protocol on the DOME, REMOTE, and PC ports, and Diamond protocol on the RVS3000 JOYSTICK port.

All Vicon VPN ports are set for 19.2 kbps, 8 data bits, no parity, and 1 stop bit. The Diamond protocol port is set for 9600 bps, even parity, and 1 stop bit.

Ensure that all controllers are set to the proper communication parameters. Also ensure that the dome is set to Vicon VPN protocol. On a Surveyor dome, this is accomplished by setting switch SW2 to positions 1 and 3 ON, and all others OFF. The dome will start up in 'autobaud' detection mode. Send data to the dome using the RVS3000 in order to cause the dome to select 9600 bps.

The following procedures are used to toggle the Power Draw information screen:

REMOTE and PC Vicon VPN port: Recalling Preset 1 will toggle the Power Draw display screen.

JOYSTICK RVS3000 port: Toggle the Power Draw information screen by issuing a "Go To Preset 1" command.

The PC port and Joystick port can be used to configure the dome as well. To configure the dome using the PC port and the Vicon control software, consult the Vicon Operation and Programming manual for the dome. To configure the dome using the RVS3000, issue a "Set Preset 94" command to call up the dome setup menu. The menu is navigated using the joystick and the Vicon VPN "auto iris' and 'auto pan' commands. The 'auto iris' command is invoked by the RVS3000 by issuing a "Go To Preset 92" command. The 'auto pan' command is invoked by the RVS3000 by issuing a "Go To Preset 93" command.

To select Iris modes, issue a "Go To Preset 92" command from the RVS3000 to enable or disable Auto Iris mode. To select the iris mode from the Axis web browser use the control panel to send an Auto Iris ON or OFF command (either will work). Each time a command is issued, the mode will toggle.

PORT PROTOCOL SELECTION OPTION 4

This option utilizes Pelco D protocol on the DOME, REMOTE, and PC ports, while utilizing Diamond protocol on the JOYSTICK port. Pelco D protocol operates at 2400 bps, 8 data bits, No parity, and 1 stop bit. Ensure that all controllers are set to these same communication parameters. The Diamond JOYSTICK port operates at 9600 bps, even parity, 8 data bits, and 1 stop bit.

To toggle the Power Draw Information screen issue a "Go To Preset 1" command from any controller. The Power Draw Information screen can also be enabled/disabled using the "Ctrl panel" function "Backlight comp" when using the Axis 282 Encoder. Enable the control panel by clicking on the 'Ctrl panel' button on the browser. "Backlight comp" ON enables the Power Draw Information screen, while "Backlight comp" OFF disables the Power Draw Information screen.

BOOT MODE AND APPLICATION CODE UPDATES

First, be sure the following files are all in a common folder (directory) on the PC or laptop being used to update the firmware:

AVROSP.exe
getkey.exe
prog.bat
fieldbox.hex
ATmega664P.xml

Next, connect an RS-232 cable between the PC or laptop and the PC DB9 port of the Field Box. The cable should be a straight-through cable, and not a NULL-Modem cable.

To enter Boot Mode, set position 8 on DIP switch S2 (OPTIONS SWITCH) to ON. If the Field Box is unpowered, turn on the power switch. If the Field Box is powered, press S3 to reset the Field Box. After either of these operations, all 4 LEDs D1-D4 should be lit solidly to indicate that the Field Box is in Boot mode.

Now double-click on the file 'prog.bat' from Windows Explorer on the PC. The program will automatically select and set up the proper COMM port on the PC or laptop. The file should open up a DOS dialog box that scrolls through text that looks similar to the following. In this instance, the Field Box is connected to the PC's COM1 port.

H:\TREEHA~1\fieldbox\firmware>mode com1 baud=19200 parity=n data=8

Status for device COM1:

Baud: 19200
Parity: None
Data Bits: 8
Stop Bits: 1
Timeout: ON
XON/XOFF: OFF
CTS handshaking: OFF
DSR handshaking: OFF
DSR sensitivity: OFF
DTR circuit: ON
RTS circuit: OFF

H:\TREEHA~1\fieldbox\firmware>mode com2 baud=19200 parity=n data=8

Status for device COM2:

Baud: 19200
Parity: None
Data Bits: 8
Stop Bits: 1
Timeout: OFF
XON/XOFF: OFF
CTS handshaking: OFF
DSR handshaking: OFF
DSR sensitivity: OFF
DTR circuit: ON
RTS circuit: ON

H:\TREEHA~1\fieldbox\firmware>mode com3 baud=19200 parity=n data=8
Illegal device name - COM3

H:\TREEHA~1\fieldbox\firmware>mode com4 baud=19200 parity=n data=8
Illegal device name - COM4

H:\TREEHA~1\fieldbox\firmware>REM avrosp -dATmega664P -iefieldbox.eep -pe

H:\TREEHA~1\fieldbox\firmware>avrosp -dATmega664P -iffieldbox.hex -e -pf
AVR Open-source Programmer $Revision: 1163 $ (C) 2004 Atmel Corp.

Scanning COM ports for supported programmer...

Found AVRBOOT on COM1!
Entering programming mode...
Parsing XML file for device parameters...
Parsing '.\ATmega664P.xml'...
#######
Saving cached XML parameters...
Signature matches device!
Erasing chip contents...
Reading HEX input file for flash operations...
##
##
##
##
##
##

##
##
##
##
##
##
##
################
Programming Flash contents...
Using block mode...
##
##
##
################
Leaving programming mode...

H:\TREEHA~1\fieldbox\firmware>avrosp -dATmega664P -iffieldbox.hex -vf
AVR Open-source Programmer $Revision: 1163 $ (C) 2004 Atmel Corp.

Scanning COM ports for supported programmer...

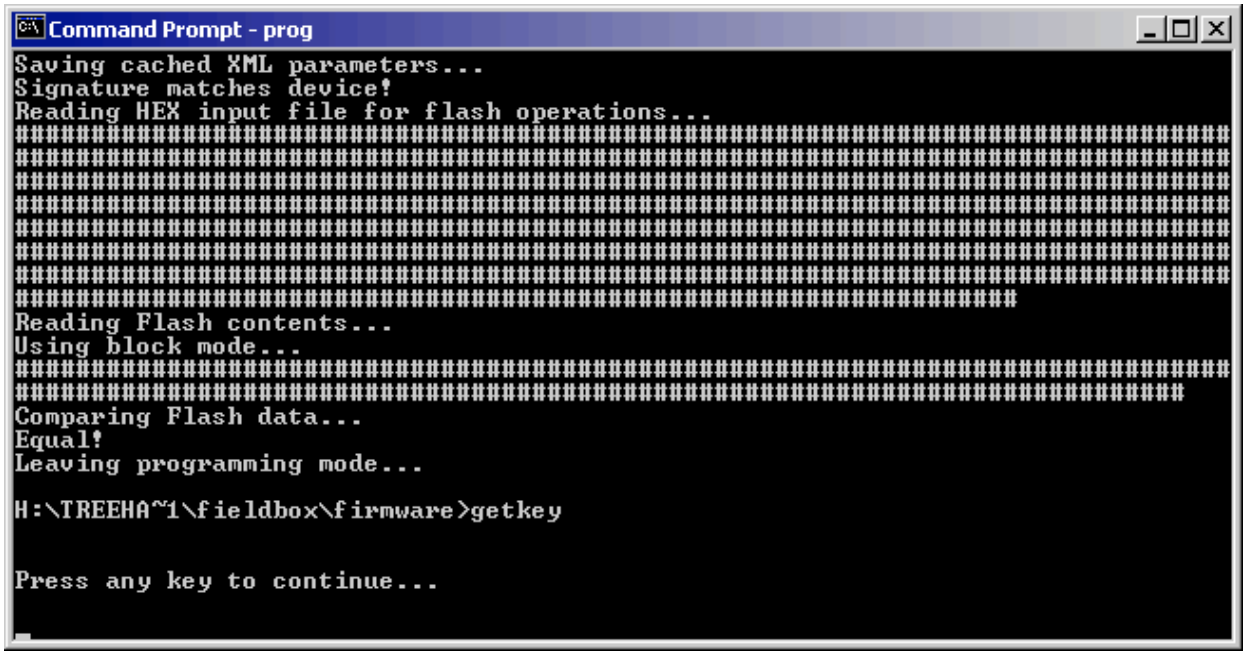
Found AVRBOOT on COM1!
Entering programming mode...
Parsing XML file for device parameters...
Parsing '.\ATmega664P.xml'...
########
Saving cached XML parameters...
Signature matches device!
Reading HEX input file for flash operations...
##
##
##
##
##
##
##
##
##
##
##
##
##
##
##
################
Reading Flash contents...
Using block mode...
##

**##
##
################
Comparing Flash data...
Equal!
Leaving programming mode...**

H:\TREEHA~1\fieldbox\firmware>getkey

Press any key to continue...

This is what the DOS dialog box should look like upon completion:



If at the bottom of the DOS dialog box you see the following:

**Comparing Flash data...
Equal!
Leaving programming mode...**

then the programming was successful. Press any key on the PC or laptop keyboard to remove the DOS dialog box. If the DOS dialog box does not display the "Equal!" message, the upload was unsuccessful. If unsuccessful, verify that the RS-232 cable is installed properly and then repeat the above procedure.

Upon a successful firmware upload, change back the DIP switch S2 position 8 setting to OFF. Then press the reset button S3 to reset the Field Box. The Field Box should then enter normal operating mode.

Technical Specifications

Front Panel Indicators:
5 VOLTS = Power Supply Status
REMOTE = PTZ Data Activity on Remote Port
JOYSTICK = PTZ Data Activity on Joystick Port
PC = PTZ Data Activity on PC Port
TX DOME = PTZ Data Activity to Camera
NETWORK = AXIS Video Server Network Activity
STATUS = AXIS Video Server Network Status

Electrical:
AC input Voltage: 120VAC 50/60 Hz, 1.8A
Dome Power Output: 24V, 50/60 Hz, 1.25A
Heater Power Output: 24V, 50/60 Hz, 5A

Mechanical:
Dimensions:
19" W x 3.5" H x 12" D

Environmental:
Operating Temperature: -10 deg F (-23 deg C) to 140 deg F (60 deg C)
Humidity: 5% to 95%, non-condensing

Data:
Joystick: RS-422, Rx+, Rx-, Tx+, Tx-
Laptop: RS-232, Tx, Rx, Gnd
Remote Control: RS-422, Rx+ Rx-, Tx+, Tx-

Video:
Camera Input: BNC, 75 Ohms
Monitor Output: BNC, 75 Ohms

Video Server:

Video Compression:	Motion JPEG MPEG-4 Part 2 (ISO/IEC 14496-2), Profiles: ASP and SP
Resolutions:	4CIF, 2CIFExp, 2CIF, CIF, QCIF max 704x480 (NTSC) 768x576 (PAL) min 160x120 (NTSC) 176x144 (PAL)
Frame Rate: (MTSC/PAL)	Motion JPEG: Up to 30/25 fps at 4CIF MPEG-4: Up to 30/25 fps at 2CIF Up to 20/17 fps at 4CIF
Video Streaming:	Simultaneous Motion JPEG and MPEG-4 Controllable frame rate and bandwidth Constant and variable bit rate (MPEG-4)
Pan/Tilt/Zoom:	A wide range of both analog and IP PTZ dome cameras are supported, free drivers available at www.axis.com 20 presets, Guard tour, PTZ control queue
Image Settings:	Compression Levels: 11 (Motion JPEG) /23 (MEG-4) Rotation: 90°, 180°, 270° Aspect ratio correction Color: color, black & white Overlay capabilities: time, date, text, image or privacy mask De-interlace filter

www.treehavenvision.com

Manual PN: 343117 05/10 Rev A

©2010 Treehaven Technologies, Inc. All rights reserved. No part of this publication may be reproduced by any means without written permission from Treehaven Technologies. The information in this publication is believed to be accurate in all respects. However, Treehaven Technologies cannot assume responsibility for any consequences resulting from the use thereof. The information contained herein is subject to change without notice. Revisions or new editions to this publication may be issued to incorporate such changes.